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IS 12854 (1989): Power transmission - Belts, endless flat  
(used in lenix drive system) [PGD 31: Bolts, Nuts and  
Fasteners Accessories]



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**IS 12854 : 1989**

( Reaffirmed 2005 )

*Indian Standard*

**POWER TRANSMISSION — BELTS, ENDLESS  
FLAT (USED IN LENIX DRIVE SYSTEM) —  
SPECIFICATION**

UDC 621.85.052.41

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**BUREAU OF INDIAN STANDARDS**  
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**Price Group 2**

**FOREWORD**

**This Indian Standard was adopted by the Bureau of Indian Standards on 15 November 1989, after the draft finalized by the Pulleys and Belts Sectional Committee had been approved by the Light Mechanical Engineering Division Council.**

**This standard is based on the manufacturing practices followed in India. Assistance has also been derived from IRS.E 39-75 published by RDSO ( Ministry of Railways, Government of India ).**

## Indian Standard

# POWER TRANSMISSION — BELTS, ENDLESS FLAT (USED IN LENIX DRIVE SYSTEM) — SPECIFICATION

### 1 SCOPE

**1.1** This standard covers the requirements of endless cord lenix flat belts for the use of power transmission in jute machineries like spinning frames, carding machines, drawing frames and softener machines, etc. These belts are also used for machine tools, compressors and pumps.

**1.2** These belts are generally used for fixed centre drives where idler pulleys, are utilised for belt tension adjustments and can also be used for drives where adjustment of centres are available.

**1.3** Lenix belts can have friction surface on both sides.

### 2 REFERENCES

**2.1** IS 1370 : 1976 'Friction surface rubber transmission belting (second revision)' is necessary adjunct to this standard.

### 3 CONSTRUCTION

**3.1** Belts are flat endless type having round edge and are manufactured in varying widths from 25 mm to 550 mm and thicknesses from 3 mm to 9.5 mm. The length of the belt shall indicate the inside circumference only.

**3.2** The belts are manufactured with tension member either cable cord or weftless woven cords. Depending upon the power rating of the belts the number of layers of the tension member varies from 1 to 6.

**3.3** The body of the belt consists of two or more layers of rubberised fabric which incorporates the cords inside it.

**3.4** The enveloping rubberised fabric, responsible for friction and abrasion resistance, is bias cut for joining. The joint is covered with a thin rubberised fabric strip (called breaker strip) to strengthen the joint, keeping the thickness uniform.

**3.5** The type of the cords, number of layers and the grade of canvas vary depending on the thickness of the belts.

### 4 REQUIREMENTS

#### 4.1 Hardness

The hardness of the belts shall be  $90^\circ \pm 5^\circ$  (Durometer A).

NOTE — If the hardness of the composite belt varies more than  $\pm 5^\circ$  on  $90^\circ$  (Durometer A), it has an effect on flexibility of the belt.

#### 4.2 Elongation

When checked with a 25 mm wide belt on a length of 180 mm between the gripping jaws, with the reference lines marked 100 mm the elongation percentage shall not be more than that given below:

| Thickness of Belts<br>mm | Load<br>N | Elongation<br>Percent,<br>Max |
|--------------------------|-----------|-------------------------------|
| 3                        | 750       | 2.5                           |
| 5                        | 1 500     | 2.5                           |
| 6.4                      | 2 500     | 2.5                           |
| 9.5                      | 5 000     | 3                             |

#### 4.3 Breaking Strength

Breaking strength of belts shall be as follows:

| Thickness of Belts<br>mm | Breaking Strength<br>Min, N |
|--------------------------|-----------------------------|
| 3                        | 1 500                       |
| 5                        | 2 000                       |
| 6.4                      | 4 000                       |
| 9.5                      | 10 500                      |

**4.3.1** The breaking strength test is to be carried out on the finished belting in a tensile testing machine as per method of test given in Annex A.

#### 4.4 Adhesion Test

The adhesion between different layers of fabric to cord, while tested in a manner as described in Annex C of IS 1370 : 1976, shall not be less than 22 N per 10 mm width.

#### 4.5 Power Rating

Just for use of designers the power ratings per 25 mm width of belts for different thicknesses at  $180^\circ$  arc of contact are given in Table 1.

**Table 1 Power Ratings in Kilowatts per 25 mm Width of Endless Rayon Cord Reinforced Flat Belts for Lenix Drive System**

( Clause 4.5 )

| Belt Thickness<br>mm | Belt Speed<br>m/sec | Smaller Pulley Diameter in Millimetres |      |      |      |               |               |
|----------------------|---------------------|----------------------------------------|------|------|------|---------------|---------------|
|                      |                     | 25                                     | 50   | 75   | 100  | 150           | 200 and above |
| 3                    | 5                   | 0.23                                   | 0.34 | 0.45 | 0.63 | 0.86          | 0.97          |
|                      | 10                  | 0.41                                   | 0.61 | 0.82 | 1.12 | 1.49          | 1.75          |
|                      | 15                  | 0.54                                   | 0.81 | 1.08 | 1.53 | 2.05          | 2.42          |
|                      | 20                  | 0.60                                   | 0.89 | 1.19 | 1.79 | 2.46          | 2.91          |
|                      | 25                  | 0.57                                   | 0.85 | 1.19 | 1.94 | 2.72          | 3.32          |
|                      | Belt Speed<br>m/sec | Smaller Pulley Diameter in Millimetres |      |      |      |               |               |
|                      |                     | 75                                     | 100  | 150  | 200  | 250           | 350 and Above |
| 5                    | 5                   | 0.71                                   | 1.02 | 1.37 | 1.55 | 1.67          | 1.67          |
|                      | 10                  | 1.31                                   | 1.79 | 2.38 | 2.30 | 3.10          | 3.16          |
|                      | 15                  | 1.73                                   | 2.45 | 3.28 | 3.88 | 4.29          | 4.65          |
|                      | 20                  | 1.91                                   | 2.86 | 3.93 | 4.65 | 5.25          | 5.67          |
|                      | 25                  | 1.91                                   | 3.10 | 4.35 | 5.31 | 5.97          | 6.50          |
|                      | Belt Speed<br>m/sec | Smaller Pulley Diameter in Millimetres |      |      |      |               |               |
|                      |                     | 75                                     | 100  | 150  | 200  | 250           | 350 and Above |
| 6.4                  | 5                   | 0.89                                   | 1.27 | 1.71 | 1.94 | 2.09          | 2.09          |
|                      | 10                  | 1.64                                   | 2.24 | 2.98 | 3.50 | 3.88          | 3.05          |
|                      | 15                  | 2.16                                   | 3.06 | 4.10 | 4.85 | 5.37          | 5.82          |
|                      | 20                  | 2.39                                   | 3.58 | 4.92 | 5.82 | 6.56          | 7.09          |
|                      | 25                  | 2.39                                   | 3.88 | 5.44 | 6.64 | 7.46          | 8.13          |
|                      | Belt Speed<br>m/sec | Smaller Pulley Diameter in Millimetres |      |      |      |               |               |
|                      |                     | 200                                    | 250  | 300  | 350  | 400 and Above |               |
| 9.5                  | 5                   | 3.49                                   | 3.76 | 5.00 | 6.11 | 7.23          |               |
|                      | 10                  | 6.31                                   | 6.98 | 9.25 | 11.3 | 13.3          |               |
|                      | 15                  | 8.72                                   | 9.67 | 12.7 | 15.6 | 18.4          |               |
|                      | 20                  | 10.5                                   | 11.8 | 15.5 | 19.0 | 22.4          |               |
|                      | 25                  | 11.9                                   | 13.4 | 17.5 | 21.5 | 25.3          |               |

## ANNEX A

### ( Clause 4.3.1 )

#### METHOD OF TESTING BREAKING STRENGTH AND ELONGATION

##### A-1 TEST PIECES

**A-1.1** The test pieces shall be cut so as to contain no joint. The belting sample of 25 mm width shall not be less than 300 mm long.

##### A-2 PREPARATION AND CONDITIONING OF THE TEST PIECES

**A-2.1** The test pieces shall be cut not less than 5 days from the date of the manufacture of the belts and test pieces shall be conditioned for 3 days at  $27 \pm 2^\circ\text{C}$  and  $65 \pm 5$  percent relative humidity.

##### A-3 APPARATUS

**A-3.1** The accuracy of the tensile testing machine shall be within  $\pm 0.5$  percent.

**A-3.2** The range of the machine shall be so chosen, that the loads to be measured fall within 20 percent and 100 percent of the full scale deflection.

**A-3.3** The load shall be applied smoothly and the rate of traverse of the driven grip shall be 100 mm/min.

**A-3.4** The method of holding the test pieces shall be such as to ensure proper alignment of the test pieces eliminating slippage or damage during testing. The use of transverse serrated jaws is permissible. The grip shall be free to move without undue friction and incorrect alignment.

##### A-4 PROCEDURE

**A-4.1** The reference lines shall be marked 100 mm apart and the test piece shall be placed in the grips or jaws of the machine and shall be carefully positioned in line with the front edge of the jaws so that the axis of the test piece coincides with the centre line of the jaws.

**A-4.2** The machine shall be started and the driven jaws traversed at the specified rate until rupture of the test piece occurs, at which point the maximum load applied shall be noted.

**A-4.3** The results of breaks occurring outside the reference lines on the test piece shall normally be discarded, but if results of such tests are required they shall be recorded as 'jaw breaks'.

**A-4.4** The elongation shall be determined by measuring the distance between the reference lines at break.

##### A-5 RESULTS

**A-5.1** The tensile strength of each test piece shall be recorded in N and the mean value for each of the three tests shall be recorded.

**A-5.2** The elongation values in the longitudinal direction shall be expressed as a percentage of the initial distance between the reference lines. The mean values for the three tests shall be recorded.

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